transmitting the computed rotational velocity component as a control signal to an electronic or electromechanical device.

6. The method of claim 5 further comprising:

computing a translation weighting for each contact associated with a finger;

computing translational velocity components for each contact associated with a finger;

computing a translational velocity average from the computed translational velocity components and the computed translation weightings; and

transmitting the computed translational velocity average as a control signal to an electronic or electromechanical device.

7. A method for extracting multiple degrees of freedom of hand motion from successive proximity images, the method comprising:

tracking a plurality of contacts associated with a plurality of hand parts across the successive proximity images;

computing a translation weighting for each contact associated with a finger;

computing translational velocity components for each contact associated with a finger;

computing a translational velocity average from the computed translational velocity components and the computed translation weightings and

transmitting the computed translational velocity average as a control signal to an electronic or electromechanical device.

8. The method of any one of claims 1-7 wherein transmitting the computed velocity components further comprises filtering the computed velocity components prior to transmission.

9. The method of claim 8, wherein filtering the computed velocity components further comprises:

downscaling each velocity component in proportion to a function of its average speed compared to other average component speeds; and

dead-zone filtering each downscaled velocity component wherein dead-zone width depends on distribution of current component speeds.

10. The method of claim 1-7 further comprising transmitting an orientation of an ellipse fitted to a thumb contact to an electronic or electromechanical device.

11. The method of claim 8 further comprising transmitting an orientation of an ellipse fitted to a thumb contact to an electronic or electromechanical device.

12. The method of claim 9 further comprising transmitting an orientation of an ellipse fitted to a thumb contact to an electronic or electromechanical device.

13. A method for extracting multiple degrees of freedom of hand motion from successive proximity images representing successive scans of a plurality of proximity sensors of a multi-touch surface, the method comprising:

tracking, through successive proximity images, a plurality of groups of pixels associated with a plurality of fingers on or near the multi-touch surface;

identifying a group of pixels corresponding to an innermost finger and a group of pixels corresponding to an outermost finger;

computing a scaling velocity from a change in a distance between the innermost and outermost fingers; and

transmitting the computed scaling velocity as a control signal to an electronic or electromechanical device.

14. The method of claim 13 further comprising:

computing a rotational velocity from a change in angle between the innermost and outermost fingers; and

transmitting the computed rotational velocity as a control signal to an electronic or electromechanical device.

15. The method of claim 14 further comprising:

computing a translation weighting for each finger;

computing a translational velocity for each finger;

computing a translational velocity average from the computed translational velocities and the computed translation weightings; and

transmitting the computed translational velocity average as a control signal to an electronic or electromechanical device.

16. The method of claim 13 further comprising:

computing a translation weighting for each finger;

computing a translational velocity for each finger;

computing a translational velocity average from the computed translational veliocities and the computed translation weightings; and

transmitting the computed translational velocity average as a control signal to an electronic or electromechanical device.

17. A method for extracting multiple degrees of freedom of hand motion from successive proximity images representing successive scans of a plurality of proximity sensors of a multi-touch surface, the method comprising:

tracking, through successive proximity images, a plurality of groups of pixels associated with a plurality of fingers on or near the multi-touch surface;

identifying a group of pixels corresponding to an innermost finger and a group of pixels corresponding to an outermost finger;

computing a rotational velocity from a change in angle between the innermost and outermost fingers; and

transmitting the computed rotational velocity as a control signal to an electronic or electromechanical device.

18. The method of claim 17 further comprising:

computing a translation weighting for each finger;

computing a translational velocity for each finger;

computing a translational velocity average from the computed translational velocities and the computed translation weightings; and

transmitting the computed translational velocity average as a control signal to an electronic or electromechanical device.